California Regional Water Quality Control Board

Central Valley Region

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SUBJECT: RESPONSE TO REVIEW OF ANNUAL MONITORING REPORT – SOUTHERN SAN JOAQUIN VALLEY WATER QUALITY COALITION – KAWEAH RIVER SUB-WATERSHED

Staff Review

On 1 April 2005, we received the Annual Monitoring Report (AMR) for the Southern San Joaquin Valley Water Quality Coalition's (SSJVWQC) Kaweah River Sub-watershed. This report was submitted by the SSJVWQC to meet the conditions of Resolution R5-2003-0105 and the associated Conditional Waiver of Waste Discharge Requirements for Discharges from Irrigated Lands (Conditional Waiver) adopted by the Regional Board on 11 July 2003.

Regional Board staff met with the SSJWQC on 17 May 2005 to discuss preliminary comments and general deficiencies generated as part of the AMR review. Regional Board staff has continued the review of the AMR to evaluate the document for the required reporting conditions detailed in Resolution R5-2003-0105, the conditions set forth in the Kaweah River Sub-watershed's Monitoring and Reporting Program Plan (MRP Plan), the Quality Assurance Project Plan (QAPP), and to assess the quality of the data generated and the conclusions and recommendations presented. The review has been broken into three major categories: 1) a discussion of administrative aspects; 2) a discussion of analytical aspects; and 3) a discussion of waiver compliance.

Administrative Aspects

The Kaweah River Sub-watershed AMR was submitted on time, under appropriate cover letter, and included the major components required by Resolution R5-2003-0105. Sampling was preformed at the four sites set forth in the MRP Plan and the samples collected were analyzed for the required constituents. Quality assurance/quality control (QA/QC) samples were collected at the appropriate frequency and the analytical results were reported in table format as required. However, a few administrative deficiencies were noted.

Item 1: Monitoring site locations need to be provided in Global Positioning System (GPS) coordinates as required on page 10 of Resolution No. R-5-2003-0105.

Item 2: Kaweah River Sub-watershed field data sheets are not included in the report. This information is necessary to determine if Fruit Growers Laboratories (FGL) collected the samples according to the Waiver requirements. An example of this is the dissolved oxygen (DO) samples collected by FGL: it is not clear whether the samples were fixed for DO prior to shipment to the lab.

Item 3: Chain of custody documentation needs to be preformed in accordance with Attachment A of Resolution R5-2003-0826 pages 5 and 6. Chain of custody documents included in the AMR did not specify custody seals, number of bottles, transportation method (ice chest cooled to 4 degrees C), and included missing time and insufficient signatures.

Item 4: Original laboratory data sheets were not included in the report. This is especially significant for the water column and sediment toxicity testing.

Item 5: Communication reports need to be promptly sent to the Regional Board when toxicity is detected or water quality objective exceeded. Problems associated with the 21 February 2005 storm-water sampling event were documented in a communication report received 17 May 2005. No communication report was submitted for the 22 July 2004 irrigation-sampling event (45% survival for fathead minnow) or the 26 October 2004 sediment sampling (SP-2, 35%; SP-3, 25%; and SP-3, 17.5% survival for Hyllella azteca). Communication reports need to be submitted for exceedances of all water quality parameters, including pH, DO, coliform, pesticides, and other parameters that have associated Basin Plan objectives.

Item 6: The detailed land use map presented as Figure 2.2 covers the area generally east of Highway 99 and north of Ave 260: or approximately ½ of the Sub-watershed area. Additional information needs to be generated for the remaining balance of the region.

Item 7: Table 2.2 of the AMR (Summary of Pesticide Use) contains information for approximately half of the Sub-watershed. No information has been provided for T19S, Ranges 21-26E or T20S Ranges 23-27E. Additionally, it is unclear what the column titled “No. of Sections” is meant to represent. Clarification is needed as to whether or not this represents the number of sections within the 36-square mile block to which pesticides have been applied.

Analytical Aspects

Chemical analysis of samples collected for the AMR were run in accordance with the methods prescribed in Resolution R5-2003-0105 with the results presented in the required tabulated format (Tables 1-7 through 1-9). The review of the analytical results presented in the AMR had been broken down into the following categories: physical parameters (including metals and nutrients); toxicity testing; pesticide testing; quality control findings; and follow-up.

Item 8: Physical parameters are within excepted limits with the following exceptions:
E Coli levels in storm water samples (10 January 2005) collected from all four monitoring sites are elevated; SP-1 (313 MPN/100ml), SP-2 (1990 MPN/100ml), SP-3 (488 MPN/100ml), and SP-4 (816 MPN/100ml). Additionally, E Coli in the irrigation sample collected from SP-2 was also high (727 MPN/100ml).

Elevated measurements of conductivity (584 umhos/cm), total organic carbon (6300 ug/l), and total dissolved solids (430 mg/l) were present in the irrigation sample collected from SP-3. These levels coupled with a turbidity reading of 173.0 NTU for the storm water sample from SP-3 (outside the normal range for eastside streams), plus Total Kjeldahl Nitrogen of 1.3 mg/l, indicates that a potential problem may exist and will need to be further evaluated as the sampling program proceeds.

Item 9: Toxicity testing results could only be evaluated from the reported findings. No raw data sheets were included with the results. A potential problem with this was noted in the control group survival for Selenastrum on 22 July 2004. The control group had reduced survival but the lab did not invalidate the test results. Water column toxicity testing for the irrigation-sampling event detected no problems with Selenastrum growth. Fathead minnow survival rates were affected, however, in all three samples: SP-1 (65%), SP-2 (80%), and SP-3 (45%). Additionally, low-level toxicity was exhibited to Ceriodaphnia in the sample collected from SP-1 (85% survival). Sediment toxicity to Hyalella was detected in all of the irrigation samples with survival rates of 75% (SP-1), 35% (SP-2), 25% (SP-3), and 17.5% (SP-4).

Item 10: Pesticide sampling results did not detect any organochlorine, organophosphorus, herbicides, carbamates, or pyrethroids at or above detection limits. However, the analysis did not include glyphosate, simazine, diuron, paraquat, dichloride or esfenvalerate. A general problem with detection limits was also noted in the analysis conducted for organophosphorus. Detection limits were 2 micrograms per liter (ug/L), well above the fresh water acute toxicity trigger for diazinon (0.16 ug/L) and chlopyrifos (0.05 ug/L) set forth by Fish and Game. Laboratory practical quantitation limits (PQLs) must be low enough to provide data that will be meaningful with respect to water quality objectives.

Field quality control samples were collected and analyzed at the appropriate frequency for physical parameters. No toxicity QA/QC samples were collected or analyzed. As the number of sampling events increases in the coming season, toxicity QA/QC samples will need to be collected and analyzed on the required 5% basis.

Item 11: Laboratory QA/QC data was appropriate with a sufficient number of spikes, method blanks, laboratory control samples (LCS), surrogates, continuing calibration verification (CCV), and calculated relative percent difference (RPD). However, a QA/QC problem was observed in the pesticide analysis data submitted by FGL and to a lesser extent by Appl Laboratories. This problem was pointed out in the AMR and in a Communication Report dated 17 May 2005. In the case of Appl Laboratories, the problem was with laboratory control spikes and surrogate recoveries being above their upper control limits. Because none of the affected compounds were detected in the sample, no further action was taken and the results were accepted. The problems that occurred with FGL's analysis were similar; with the results of blank spikes, LCS and CCV being above the

accepted limits. A variety of methods were used by FGL to validate the test results. It is troubling that such a variety of problems were encountered during the running of the pesticide analysis; however, it is the Regional Boards position that the acceptability of the analytical results rests with the Certified Laboratory performing the tests in conjunction with the requirements set forth in the EPA methods. This requirement is set forth in section 8.1 of Order No. R5-2003-0826 (Quality Assurance Project Plan, page 12).

Item 12: Follow-up studies to toxic events were only partially preformed. Water column toxicity to Fathead minnow (as low as 45% survival) and sediment toxicity to Hyalalla (as low as 17.5% survival) was detected in the irrigation sampling. No Toxicity Identification Evaluation (TIE), follow-up sampling, or Communication Reports (CR) were preformed as of the date of the report. Subsequent to receipt of the AMR, two CRs were received (both dated 17 May 2005). The first CR dealt with laboratory QA/QC problems contained within the AMR. The second reported mortality and reduced growth observed in a storm water sample collected 21 February 2005.

Monitoring and Reporting Program, Order No. R5-2003-0105 (page 5), states when toxicity is detected, a TIE and chemical monitoring shall be conducted to determine the cause of toxicity. At a minimum, a Phase 1 TIE should be conducted to determine the general class of chemical causing the toxicity. The results of the minimum TIE will determine the type of chemical monitoring necessary to identify the specific agents causing toxicity. In addition to TIEs, sites identified as toxic in the initial screen, shall be re-sampled to estimate the duration of the toxic event. Samples should also be collected upstream of the initial sampling point to help determine the source of the toxicity. Additionally, information must be collected from dischargers on the type of management practices that are being used, the degree to which they are being implemented within the watershed, and how effective they are in protecting waters of the State through all phases of monitoring. Communication Reports are the method by which the Regional Board is notified of a water quality exceedance. Notification needs to be prompt. At a minimum, the Communication Report shall include: a description of the management practice(s) being evaluated; methodology for evaluating the effectiveness of the practice (including sampling and QA/QC plans); and the involvement by stakeholders and agencies in developing, implementing, and evaluating the project (Monitoring and Reporting Program, Order No. R5-2003-0105, pages 12 and 13).

Waiver Compliance

Certain aspects of the Waiver program may not have been completely addressed in the Watershed Evaluation, QAPP, and MRP Plan, and subsequently, were not included in the AMR. While these documents have received prior approval by the Board, it is staff's position that additional information and/or actions should be undertaken at this time in order to fully comply with the Waiver program. These actions include: increasing the number of sampling points; the frequency of sampling; and actions taken to address water quality impacts.

Item 13: Monitoring and Reporting Program, Order No. R5-2003-0105 (pages 8 and 10) states that the number of monitoring sites shall be based on acreages and watershed characteristics sufficient to allow for the calculation of load discharged for every waste parameter. Additionally, all major drainages must be part of baseline monitoring. At least 20% of the intermediate drainages must be monitored during the first year and the second 20% the second year, etc.

The approximate limits of current surface-water monitoring program are presented on Figure 2.2 of the AMR. This area equates to approximately 141,500 acres of the reported 400,000 acres contained in the Sub-watershed, or approximately 35%. This percentage is much too low and does not allow for sufficient coverage of the irrigated farmland contained within the Sub-watershed. The vast majority of irrigated agriculture is located south of the City of Visalia and west of Highway 99. This area is not currently being monitored. Additional sampling points need to be added throughout the Sub-watershed to increase the level of coverage.

The review of the AMR found no mention of additional sampling proposed for either the major drainages or on the required 20% of the intermediate drainages. This is a inconsistent with the terms of the waiver and needs to be addressed.

A study of aerial photographs and topographic maps of the region indicate that Cross Creek (9 mile section south of the confluence of Mosquito Creek), Mill Creek (~18 miles long), Packwood Creek (~15 miles long), Outside Creek (~11 miles long), and Elk Bayou (~6 miles long) are, at a minimum, secondary or intermediate drainages, and coupled with Deep Creek, Mosquito Creek, Cameron Creek, Inside Creek, Bates Slough, and Elbow Creek should be considered for inclusion in the monitoring program.

Elbow Creek is a northwest trending intermittent drainage located between the Saint Johns River to the south and Cottonwood Creek to the north. Elbow Creek is contained within the limits of the surface-water monitoring program but is not currently being sampled. The creek, or a portion of the creek, appears to act as an irrigation water-delivery system in the growing season and as a storm-water conduit, draining mainly citrus groves, in the winter. If sufficient flow is present and not diverted by one of the many irrigation canals that flow into and out of the creek, flow from Elbow Creek will enter Cottonwood Creek approximately 2 miles east of it's convergence with Cross Creek (approximately 5 miles east of SP-4). Statistically significant toxicity to Selenastrum was discovered in this waterway as well as sediment toxicity to Hyalella (58% mortality) in Mill Creek (Central Valley Regional Water Quality Control Board Conditional Waiver for Irrigated Agriculture Monitoring Program, Phase II, and preliminary results from Donald Weston adjunct associated professor, UC Berkeley). In response to the toxicity detected in these creeks, it is staff's position that Elbow Creek and Mill Creek should be included in the sampling program.

Item 14: The frequency of sampling set forth in the Waiver program is once a month during the irrigation season and twice during the storm season. Additionally, when toxicity is discovered, re-sampling is to be preformed and samples are to be collected upstream to aid in determining the limits of toxicity. The Kaweah River Sub-watershed AMR does not contain any information regarding resampling, or sampling upstream in response to the detected toxic events (Fathead minnow mortality rates as high as 45% during the irrigation sampling).

Item 15: The Waiver requires that when monitoring results indicate that water quality objectives are exceeded in the surface waters of the Coalition Group area, the Coalition Group shall submit a Communication Report describing how it will evaluate the effectiveness of one or more management practice(s) at preventing discharge of constituents of concern to surface waters. The selection of management practice evaluation projects shall include consideration of the contribution of target

constituents of concern to known water quality impairments, potential application of the management practices over a broad geographic area and large spectrum of crops, and ease and immediacy of possible implementation. While the Waiver Program requires compliance, its staff's understanding that the management practices issue is currently evolving. Compliance will be an ongoing process and this item is meant only as an informational issue to stimulate the Sub-watershed in gathering the information necessary for the program to advance.